

09/744100

#114

## SEQUENCE LISTING

10 Rev. 1.1

04 APR 2002

A  
<110> Cahoon, Rebecca  
Gutteridge, Steven  
Lee, Jian-Ming  
McGonigle, Brian  
Rafalski, Antoni

<120> Ornithine Biosynthesis Enzymes

<130> BB-1174

<140> 09/744,100

<141>

<150> PCT/US99/15931

<151> 1999-07-14

<150> 60/093,209

<151> 1998-07-17

<160> 12

<170> Microsoft Office 97

<210> 1

<211> 1201

<212> DNA

<213> Zea mays

<400> 1

```

tcgagctcga gctcgagccc cagtcaccgc agccatgctc ctcacgaaac cctacctctc 60
caactcgctc cttccagtc ccatcccgcc gccgtcgggc cctactctca gctccaacca 120
tgcaagcccc cttgcgcgcc ctacttgccg tcgcagccgc ctccgcatct ccgccacatc 180
cacggctgcg ccgtctcctt cgtcggctgc cgctgccacc gcgtcgctga gtcgagtggg 240
cgtgctctcg gaggcgctcc cttttattca gcgattcaaa ggcaagacgg tgggtggtaa 300
gtacggcggg gcggcgatga agtccccgga gctgcaggcg tccgtgatcc gcgatctcgt 360
gctgctctcc tgcgtcggcc tccgccccgt gcttggtcac ggccggcggtc cggagattaa 420
ttcctggctg ctgcgcgctg gcgtcgagcc gcagttccgc gacggcctcc gcgtcacgga 480
cgcgctcacc atggaggctg tcgagatggg gctagtcggg aaggtaaca aaaaccttgt 540
ttccctcatc aacatcgccg gaggcaccgc cattggtctg tgcggcaagg acgcgcgcct 600
tatcaccgct cgcgcgtctc caaatgcagc ggcgctggga ttcgtcggcg aggtttcgcg 660
cgtggacgcc accgtcctcc atcccatcat cgcgcggggc catatcccg ttatcgccac 720
cgttgccgcc gacgagactg ggcaagccta taacatcaat gctgatacgg cggtggcgga 780
gattgccgct gccgtggggc ccgagaagct gctgttgctc acagatgtgt ctggcatttt 840
ggcggaccgt aatgaccctg ggagcctggt gaagtggtc gacattgctg ggggtcgga 900
gatggtggt gacgggaagg tagctggtgg gatgataccc aagggtggag gttgtgttca 960
cgcccttgca caaggtgtac acaccgcaag tatcattgat ggcgtgttc cacactctct 1020
tctgcttgag attctcacag acgagggcac aggcaccatg atcactggct gagctgcttc 1080
atgccttcat ggtattttcc tgtgcctctt ttctcatatt gttgtgtttt atggctatgt 1140
agactaaact caagattgca ataagactac ctaagtttgg ttgaaaaaaa aaaaaaaaaa 1200
a 1201

```

<210> 2

<211> 345

<212> PRT

<213> Zea mays

<400> 2

Met Leu Leu Thr Lys Pro Tyr Leu Ser Asn Ser Leu Leu Pro Val Pro  
1 5 10 15

Ser Pro Pro Pro Ser Gly Pro Thr Leu Ser Ser Asn His Ala Ser Pro  
 20 25 30  
 Leu Ala Ala Pro Thr Cys Arg Arg Ser Arg Leu Arg Ile Ser Ala Thr  
 35 40 45  
 Ser Thr Ala Ala Pro Ser Pro Ser Ser Ala Ala Ala Ala Thr Ala Ser  
 50 55 60  
 Leu Ser Arg Val Asp Val Leu Ser Glu Ala Leu Pro Phe Ile Gln Arg  
 65 70 75 80  
 Phe Lys Gly Lys Thr Val Val Val Lys Tyr Gly Gly Ala Ala Met Lys  
 85 90 95  
 Ser Pro Glu Leu Gln Ala Ser Val Ile Arg Asp Leu Val Leu Leu Ser  
 100 105 110  
 Cys Val Gly Leu Arg Pro Val Leu Val His Gly Gly Gly Pro Glu Ile  
 115 120 125  
 Asn Ser Trp Leu Leu Arg Val Gly Val Glu Pro Gln Phe Arg Asp Gly  
 130 135 140  
 Leu Arg Val Thr Asp Ala Leu Thr Met Glu Val Val Glu Met Val Leu  
 145 150 155 160  
 Val Gly Lys Val Asn Lys Asn Leu Val Ser Leu Ile Asn Ile Ala Gly  
 165 170 175  
 Gly Thr Ala Ile Gly Leu Cys Gly Lys Asp Ala Arg Leu Ile Thr Ala  
 180 185 190  
 Arg Pro Ser Pro Asn Ala Ala Ala Leu Gly Phe Val Gly Glu Val Ser  
 195 200 205  
 Arg Val Asp Ala Thr Val Leu His Pro Ile Ile Ala Ala Gly His Ile  
 210 215 220  
 Pro Val Ile Ala Thr Val Ala Ala Asp Glu Thr Gly Gln Ala Tyr Asn  
 225 230 235 240  
 Ile Asn Ala Asp Thr Ala Ala Gly Glu Ile Ala Ala Ala Val Gly Ala  
 245 250 255  
 Glu Lys Leu Leu Leu Leu Thr Asp Val Ser Gly Ile Leu Ala Asp Arg  
 260 265 270  
 Asn Asp Pro Gly Ser Leu Val Lys Val Val Asp Ile Ala Gly Val Arg  
 275 280 285  
 Lys Met Val Ala Asp Gly Lys Val Ala Gly Gly Met Ile Pro Lys Val  
 290 295 300  
 Glu Cys Cys Val His Ala Leu Ala Gln Gly Val His Thr Ala Ser Ile  
 305 310 315 320  
 Ile Asp Gly Arg Val Pro His Ser Leu Leu Leu Glu Ile Leu Thr Asp  
 325 330 335

Glu Gly Thr Gly Thr Met Ile Thr Gly  
 340 345

<210> 3  
 <211> 1186  
 <212> DNA  
 <213> Oryza sativa

<220>  
 <221> unsure  
 <222> (613)  
 <223> n = A, C, G, or T

<400> 3  
 gcacgagtag agcgccgccc ccgcccgcct gctcctcgcg aagccccacc tctcctcctc 60  
 ctcttttctc ccatccacgc ggggtgtctag ccccgctccg ggtcccaacc acgcaaagcc 120  
 catcgccgcc tctcccgccc ctcgacgctg cctccgtctc gccgtcacat ccgcccgcggc 180  
 gccggtgct tcgtcgggcg aggcggcgcc gccgctgagc cgcggtgatg tgctctcaga 240  
 ggcgctcccc ttcatccagc gcttcaaggg gaagaccgtg gtggtgaagt acggcgggcg 300  
 ggcatgaag tcgcccggagc tccaggcttc agtgatccgc gacctggtcc tctctctgtg 360  
 cgtcggcctc caccgcgtgc tcgtccacgg cggcgggccc gagatcaact cctggctgct 420  
 ccgctgcggc gtcgagccgc agttccggaa cggcctccgc gtcactgacg cgctcaacat 480  
 ggaggtcgtc gagatggtgc tcgtccgcaa ggtcaacaaa gaactcctct ccctcatcaa 540  
 actcccgggg gggagcgccg taagtctctg ttggaaggaa gctcgctcc tcaacgagcg 600  
 gccctccccg aangaaaagg gccttcggtt tgcggcggg gtctggcgcg tggacgccac 660  
 cgtcctccac ccaatcatcg cctccggtca catcccgtc atcgccactg tgggcgccga 720  
 cgagaccggg caggcctaca acatcaacgc tgacacggcg gccggcgaga tcgcccgcgc 780  
 ggtcggcgcg gagaagctgt tgctgtcac agatgtgtct ggaattcttg ccgaccgtaa 840  
 tgaccccggg agtctggtga aagagatcga cattgctggg gtgcggcaga tgggtggcca 900  
 cgggcaggtg gctggtggga tgataccgaa ggtggaatgc tgcgtgcgtg cctcgacaca 960  
 gggcgtgcac actgcaagca tcatcgatgg gcgtgtcccg cactcggtgc tgctcgagat 1020  
 tctcacagat gagggcactg gcactatgat cactggctga ggtgattcat ccgctcgtgg 1080  
 tattctccgg tgcctctctt ctcatactgt aatgtaattt gcatttgata tgcctcatga 1140  
 ttgcaataag aattgtattc ctcaaaaaaa aaaaaaaaaa aaaaaa 1186

<210> 4  
 <211> 343  
 <212> PRT  
 <213> Oryza sativa

<220>  
 <221> UNSURE  
 <222> (195)  
 <223> Xaa = ANY AMINO ACID

<400> 4  
 Met Leu Leu Ala Lys Pro His Leu Ser Ser Ser Ser Phe Leu Pro Ser  
 1 5 10 15  
 Thr Arg Val Ser Ser Pro Ala Pro Gly Pro Asn His Ala Lys Pro Ile  
 20 25 30  
 Ala Ala Ser Pro Ala Pro Arg Arg Cys Leu Arg Leu Ala Val Thr Ser  
 35 40 45  
 Ala Ala Ala Pro Ala Ala Ser Ser Ala Glu Ala Ala Ala Ala Leu Ser  
 50 55 60  
 Arg Val Asp Val Leu Ser Glu Ala Leu Pro Phe Ile Gln Arg Phe Lys  
 65 70 75 80

Gly Lys Thr Val Val Val Lys Tyr Gly Gly Ala Ala Met Lys Ser Pro  
                             85                            90                            95  
 Glu Leu Gln Ala Ser Val Ile Arg Asp Leu Val Leu Leu Ser Cys Val  
                             100                            105                            110  
 Gly Leu His Pro Val Leu Val His Gly Gly Gly Pro Glu Ile Asn Ser  
                             115                            120                            125  
 Trp Leu Leu Arg Val Gly Val Glu Pro Gln Phe Arg Asn Gly Leu Arg  
                             130                            135                            140  
 Val Thr Asp Ala Leu Asn Met Glu Val Val Glu Met Val Leu Val Arg  
 145                            150                            155                            160  
 Lys Val Asn Lys Glu Leu Leu Ser Leu Ile Lys Leu Pro Gly Gly Ser  
                             165                            170                            175  
 Ala Val Ser Leu Cys Trp Lys Glu Ala Arg Leu Leu Asn Glu Arg Pro  
                             180                            185                            190  
 Ser Pro Xaa Glu Lys Gly Leu Arg Phe Val Gly Gly Val Trp Arg Val  
                             195                            200                            205  
 Asp Ala Thr Val Leu His Pro Ile Ile Ala Ser Gly His Ile Pro Val  
                             210                            215                            220  
 Ile Ala Thr Val Gly Ala Asp Glu Thr Gly Gln Ala Tyr Asn Ile Asn  
 225                            230                            235                            240  
 Ala Asp Thr Ala Ala Gly Glu Ile Ala Ala Ala Val Gly Ala Glu Lys  
                             245                            250                            255  
 Leu Leu Leu Leu Thr Asp Val Ser Gly Ile Leu Ala Asp Arg Asn Asp  
                             260                            265                            270  
 Pro Gly Ser Leu Val Lys Glu Ile Asp Ile Ala Gly Val Arg Gln Met  
                             275                            280                            285  
 Val Ala Asp Gly Gln Val Ala Gly Gly Met Ile Pro Lys Val Glu Cys  
                             290                            295                            300  
 Cys Val Arg Ala Leu Ala Gln Gly Val His Thr Ala Ser Ile Ile Asp  
 305                            310                            315                            320  
 Gly Arg Val Pro His Ser Leu Leu Leu Glu Ile Leu Thr Asp Glu Gly  
                             325                            330                            335  
 Thr Gly Thr Met Ile Thr Gly  
                             340

<210> 5  
 <211> 1204  
 <212> DNA  
 <213> Glycine max

<400> 5  
 gcacgagatg atggcaggtg cagccaaaac cctaaccaat ctttgccct ctttccatt 60  
 cccaaccaa ccccaaaacc aactcaccac tagccacgct ttcccttcca ctgcctccg 120  
 ccaccgcgcg atttcgcggt tggcgaacgc ggcgcaacct ccactcgccg ccgccactgc 180  
 caccgagggt cagtaccgag tcgatgtgct ctcggagtcg ctccccttca tccagaaatt 240

```

ccgcggcaaa accatcgctg tcaagtacgg cggcgccgcc atgaagtccc cggagctcca 300
ggcctccgtg atcaacgacc ttgtcctcct ctctcgctc ggcctccgcc ccgtcctggt 360
ccacggcggc ggccccgaga tcaactcctg gtcggcgcc ctcaacatcc ccgccgtctt 420
ccgcgacggc ctccgcgtca ccgacgccga caccatggag atcgtctcca tggctcctcg 480
cggaagagtc aacaaaaccc tagtttctct aattaacaag gccggcgcca ccgccgtcgg 540
cctctctggc atggacggcc gcctcctcac cgcccgcccc gtcaccaagg ccgccgacct 600
cggctacgtc ggcgagggtc cagcgctcga tcccgcctc ctccgctccc taatcgacac 660
cagccacatc cccgtcgtca cctccgtcgc cgccgatgaa tccggacagc cctacaacat 720
caacgccgac accgtcgccg gagaattggc agcgtcgctc ggcgcgagga agctgattct 780
gctgaccgat gtggcgggaa ttctggaaga tcggaacgac cctgacagct tgggtgaagaa 840
gattgacata aaaggagtga agaaaatgat ggaagatgga aaagttggtg gtggaatgat 900
acctaagggtt aattgttgcg ttaggtcctt ggcgcaaggg gttattacag cgagtattat 960
tgatggtagg gttccgcatt cttgttgct tgagattttg actgatgaag gtgctggaac 1020
tatgataact ggataagttt atttatttat ggtgtttgga ttttttcttt tcaatcaagc 1080
cttgagttga ggttgcatcg cagcacttgt tttgttagag attggtgatt gtttttaagt 1140
gcgtgtaatg tgagagatgg ttgaattgaa ttgaatgttt cagaaaaaaaa aaaaaaaaaa 1200
aaaa 1204

```

<210> 6

<211> 342

<212> PRT

<213> Glycine max

<400> 6

```

Met Met Ala Gly Ala Ala Lys Thr Leu Thr Asn Leu Cys Pro Ser Phe
  1              5              10              15

Pro Phe Pro Thr Lys Pro Gln Asn Gln Leu Thr Thr Ser His Ala Phe
      20              25              30

Pro Ser Thr Arg Leu Arg His Arg Ala Ile Ser Ala Val Ala Asn Ala
      35              40              45

Ala Gln Pro Pro Leu Ala Ala Ala Thr Ala Thr Glu Gly Gln Tyr Arg
      50              55              60

Val Asp Val Leu Ser Glu Ser Leu Pro Phe Ile Gln Lys Phe Arg Gly
      65              70              75              80

Lys Thr Ile Val Val Lys Tyr Gly Gly Ala Ala Met Lys Ser Pro Glu
      85              90              95

Leu Gln Ala Ser Val Ile Asn Asp Leu Val Leu Leu Ser Cys Val Gly
      100             105             110

Leu Arg Pro Val Leu Val His Gly Gly Gly Pro Glu Ile Asn Ser Trp
      115             120             125

Leu Gly Arg Leu Asn Ile Pro Ala Val Phe Arg Asp Gly Leu Arg Val
      130             135             140

Thr Asp Ala Asp Thr Met Glu Ile Val Ser Met Val Leu Val Gly Lys
      145             150             155             160

Val Asn Lys Thr Leu Val Ser Leu Ile Asn Lys Ala Gly Ala Thr Ala
      165             170             175

Val Gly Leu Ser Gly Met Asp Gly Arg Leu Leu Thr Ala Arg Pro Ala
      180             185             190

Pro Lys Ala Ala Asp Leu Gly Tyr Val Gly Glu Val Ala Arg Val Asp

```

195 200 205

Pro Ala Val Leu Arg Ser Leu Ile Asp Thr Ser His Ile Pro Val Val  
210 215 220

Thr Ser Val Ala Ala Asp Glu Ser Gly Gln Pro Tyr Asn Ile Asn Ala  
225 230 235 240

Asp Thr Val Ala Gly Glu Leu Ala Ala Ser Leu Gly Ala Glu Lys Leu  
245 250 255

Ile Leu Leu Thr Asp Val Ala Gly Ile Leu Glu Asp Arg Asn Asp Pro  
260 265 270

Asp Ser Leu Val Lys Lys Ile Asp Ile Lys Gly Val Lys Lys Met Met  
275 280 285

Glu Asp Gly Lys Val Gly Gly Gly Met Ile Pro Lys Val Asn Cys Cys  
290 295 300

Val Arg Ser Leu Ala Gln Gly Val Ile Thr Ala Ser Ile Ile Asp Gly  
305 310 315 320

Arg Val Pro His Ser Leu Leu Leu Glu Ile Leu Thr Asp Glu Gly Ala  
325 330 335

Gly Thr Met Ile Thr Gly  
340

<210> 7  
<211> 1246  
<212> DNA  
<213> Triticum aestivum

<220>  
<221> unsure  
<222> (492)..(542)  
<223> n = A, C, G, or T

<400> 7

gcacgaggtc	taggcaagca	acccggcggc	gcgaacacca	agtccccccg	gcggccgcag	60
caatgtcct	aaccaagccc	caccccgccc	tcaccctccc	ctccgcatcc	ctcccaaata	120
ctaactaaa	ggcgcccg	gtcaggcccc	tcgctcctc	cgcgcccat	ggacgcccgc	180
ggctccgct	ctcgccctcc	tcctcctccc	tggcgccagc	gcaggccgcg	tccgcggcgc	240
tgaaccgct	ggacgtcctg	tcggaggcgc	tccccctcat	ccagcggttc	aagggaaga	300
cgggtgtgt	caagtacggc	ggcgcgcca	tgaagtcgcc	ggagctgcag	gcgtcggtga	360
tccgcgacct	ggtcctcctc	tcctgcgtcg	gcctgcgcc	cgtgctcgtg	cacggcggcg	420
gcccggagat	caactcctgg	ctgcagcgcg	tcggggtcta	gccgcagttc	cgcaacggcc	480
tccgcgtcac	gnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	540
nnaagcagct	cttatcccta	atcaggcctg	cggggaccac	agcagttggc	ctctgcagaa	600
aggacggg	catcctaacg	gagcgcccct	ccccagacgc	cgagccctc	gggttcgtcg	660
gcgaggtcac	gagaaaaaac	ccctctgtgc	tccacccgat	catcgctcc	agccacatcc	720
cggtcacgc	caccgtggct	gccgacgaga	ccgggcaagc	ctataacatc	aacgctgaca	780
ctgcgggcg	ggagatcgcg	gctgccattg	gcgccgagaa	gctgttgctg	atcactgacg	840
tgtccggcat	actcgcgac	cgggatgacc	ccgggagcct	ggtgaaggag	attgacatcg	900
cggcgctacg	gcggatggg	gccgagggca	aggtgggtgg	gggcatgata	cccaagggtg	960
gggtcgtcgt	gcgcgcgtg	gcgcagggcg	tgacacggc	cagcatcatt	gacggccgcg	1020
tccgcactc	tctcctgctc	gaaatcctca	ccgacgagg	caccggcacc	atgatcaccg	1080
gctgaaactt	gtttgtttgt	tgttgttttt	ttcttttctt	ttttggttca	cattcttttg	1140
gttgatggt	tttgcacccc	tcatttgtgt	taaagtgtgt	ttcgattcga	atcctgaaca	1200
aggagtgtg	aaagattgca	gctttaagca	aaaaaaaaaa	aaaaaa		1246

<210> 8  
<211> 340  
<212> PRT  
<213> Triticum aestivum

<220>  
<221> UNSURE  
<222> (133)  
<223> Xaa = ANY AMINO ACID

<220>  
<221> UNSURE  
<222> (144)..(160)  
<223> Xaa = ANY AMINO ACID

<400> 8  
Met Leu Leu Thr Lys Pro His Pro Ala Leu Thr Leu Pro Ser Ala Ser  
1 5 10 15  
Leu Pro Asn Pro Asn Leu Lys Ala Ala Arg Val Arg Pro Leu Ala Ser  
20 25 30  
Ser Ala Pro His Gly Arg Arg Gly Leu Arg Val Ser Ala Ser Ser Ser  
35 40 45  
Ser Leu Ala Pro Ala Gln Ala Ala Ser Ala Ala Leu Asn Arg Val Asp  
50 55 60  
Val Leu Ser Glu Ala Leu Pro Phe Ile Gln Arg Phe Lys Gly Lys Thr  
65 70 75 80  
Val Val Val Lys Tyr Gly Gly Ala Ala Met Lys Ser Pro Glu Leu Gln  
85 90 95  
Ala Ser Val Ile Arg Asp Leu Val Leu Leu Ser Cys Val Gly Leu Arg  
100 105 110  
Pro Val Leu Val His Gly Gly Gly Pro Glu Ile Asn Ser Trp Leu Gln  
115 120 125  
Arg Val Gly Val Xaa Pro Gln Phe Arg Asn Gly Leu Arg Val Thr Xaa  
130 135 140  
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
145 150 155 160  
Lys Gln Leu Leu Ser Leu Ile Arg Pro Ala Gly Thr Thr Ala Val Gly  
165 170 175  
Leu Cys Arg Lys Asp Gly Arg Ile Leu Thr Glu Arg Pro Ser Pro Asp  
180 185 190  
Ala Ala Ala Leu Gly Phe Val Gly Glu Val Thr Arg Lys Asn Pro Ser  
195 200 205  
Val Leu His Pro Ile Ile Ala Ser Ser His Ile Pro Val Ile Ala Thr  
210 215 220  
Val Ala Ala Asp Glu Thr Gly Gln Ala Tyr Asn Ile Asn Ala Asp Thr  
225 230 235 240

Ala Ala Gly Glu Ile Ala Ala Ala Ile Gly Ala Glu Lys Leu Leu Leu  
245 250 255

Ile Thr Asp Val Ser Gly Ile Leu Ala Asp Arg Asp Asp Pro Gly Ser  
260 265 270

Leu Val Lys Glu Ile Asp Ile Ala Gly Val Arg Arg Met Val Ala Glu  
275 280 285

Gly Lys Val Gly Gly Gly Met Ile Pro Lys Val Gly Cys Cys Val Arg  
290 295 300

Ala Leu Ala Gln Gly Val His Thr Ala Ser Ile Ile Asp Gly Arg Val  
305 310 315 320

Pro His Ser Leu Leu Leu Glu Ile Leu Thr Asp Glu Gly Thr Gly Thr  
325 330 335

Met Ile Thr Gly  
340

<210> 9  
<211> 439  
<212> DNA  
<213> Triticum aestivum

<400> 9  
gcacgaggtg agattgccgc tgcggtgggc gccgagaaat tgctactgct cacagatgtg 60  
tctgggatac tggcggaccg taatgaccct ggcagcctgg tgaaggagat tgacatcgct 120  
ggggtgcggc agatggtatc cgggtgggcag gttgctgggtg gaatgatccc aaagggtggag 180  
tgctgcgtga gagccctcgc ccagggtgtg cacactgcaa gcatcatcga tgggcgtgtc 240  
ccgcactcgc tgttgctcga gattctcaca gatgagggca ctggcacaat gatcaccggc 300  
taagggtgtaa aatgcctcct tgggtacttcc ttatgccttt ctgttcatac tgccaatctg 360  
ccatgtaatt tatgccaatg tagcctcacc tcatgattgc aataagagta ccttcctgac 420  
aaaaaaaaa aaaaaaaaaa 439

<210> 10  
<211> 100  
<212> PRT  
<213> Triticum aestivum

<400> 10  
Ala Arg Gly Glu Ile Ala Ala Ala Val Gly Ala Glu Lys Leu Leu Leu  
1 5 10 15

Leu Thr Asp Val Ser Gly Ile Leu Ala Asp Arg Asn Asp Pro Gly Ser  
20 25 30

Leu Val Lys Glu Ile Asp Ile Ala Gly Val Arg Gln Met Val Ser Gly  
35 40 45

Gly Gln Val Ala Gly Gly Met Ile Pro Lys Val Glu Cys Cys Val Arg  
50 55 60

Ala Leu Ala Gln Gly Val His Thr Ala Ser Ile Ile Asp Gly Arg Val  
65 70 75 80

Pro His Ser Leu Leu Leu Glu Ile Leu Thr Asp Glu Gly Thr Gly Thr  
85 90 95



Met Ile Thr Gly  
100

<210> 11

<211> 297

<212> PRT

<213> Synechocystis sp.

<400> 11

Met	Ser	Ser	Thr	Gln	Asp	Tyr	Ile	Gly	Glu	Glu	Ala	Ala	Thr	Arg	Val
1				5					10					15	
Lys	Ile	Leu	Ser	Glu	Ala	Leu	Pro	Tyr	Ile	Gln	His	Phe	Ala	Gly	Arg
			20					25					30		
Thr	Val	Val	Val	Lys	Tyr	Gly	Gly	Ala	Ala	Met	Lys	Asp	Ser	Asn	Leu
			35				40					45			
Lys	Asp	Lys	Val	Ile	Arg	Asp	Ile	Val	Phe	Met	Ala	Ser	Val	Gly	Ile
	50					55					60				
Arg	Pro	Val	Val	Val	His	Gly	Gly	Gly	Pro	Glu	Ile	Asn	Thr	Trp	Leu
	65				70					75					80
Asp	Lys	Val	Gly	Ile	Glu	Pro	Gln	Phe	Lys	Asp	Gly	Leu	Arg	Val	Thr
				85					90					95	
Asp	Ala	Ala	Thr	Met	Asp	Ile	Val	Glu	Met	Val	Leu	Val	Gly	Arg	Val
			100					105					110		
Asn	Lys	Glu	Leu	Val	Asn	Leu	Ile	Asn	Gln	Ala	Gly	Gly	Lys	Ala	Val
		115					120					125			
Gly	Leu	Cys	Gly	Lys	Asp	Gly	Gln	Leu	Met	Thr	Ala	Arg	Thr	Met	Thr
	130					135					140				
Asn	Lys	Asp	Val	Gly	Phe	Val	Gly	Glu	Val	Ser	Ser	Val	Asp	Ala	Arg
	145				150					155					160
Val	Val	Glu	Thr	Leu	Val	Lys	Ser	Gly	Tyr	Ile	Pro	Val	Ile	Ser	Ser
				165					170					175	
Val	Ala	Ala	Asp	Glu	Phe	Gly	Gln	Ala	His	Asn	Ile	Asn	Ala	Asp	Thr
			180					185					190		
Cys	Ala	Gly	Glu	Leu	Ala	Ala	Ala	Leu	Gly	Ala	Glu	Lys	Leu	Ile	Leu
		195					200					205			
Leu	Thr	Asp	Thr	Arg	Gly	Ile	Leu	Arg	Asp	Tyr	Lys	Asp	Pro	Ser	Thr
	210					215					220				
Leu	Ile	His	Lys	Leu	Asp	Ile	Gln	Gln	Ala	Arg	Glu	Leu	Ile	Gly	Ser
	225				230					235				240	
Gly	Ile	Val	Ala	Gly	Gly	Met	Ile	Pro	Lys	Val	Thr	Cys	Cys	Val	Arg
				245					250					255	
Ser	Leu	Ala	Gln	Gly	Val	Arg	Ala	Ala	His	Ile	Leu	Asp	Gly	Arg	Leu
			260					265					270		
Pro	His	Ala	Leu	Leu	Leu	Glu	Val	Phe	Thr	Asp	Leu	Gly	Ile	Gly	Ser

275

280

285

Met Ile Val Ala Ser Gly Tyr Asp Leu  
290 295

&lt;210&gt; 12

&lt;211&gt; 346

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:CONSENSUS

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (2)

&lt;223&gt; Xaa = Leu OR Met

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (3)

&lt;223&gt; Xaa = Leu OR Ala

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (4)

&lt;223&gt; Xaa = Thr, Ala, OR Gly

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (5)

&lt;223&gt; Xaa = Lys OR NONE

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (6)

&lt;223&gt; Xaa = Pro OR NONE

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (7)

&lt;223&gt; Xaa = His, Tyr, OR NONE

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (8)

&lt;223&gt; Xaa = Leu OR NONE

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (9)

&lt;223&gt; Xaa = Ser, Ala, OR NONE

&lt;220&gt;

&lt;221&gt; UNSURE

&lt;222&gt; (10)

&lt;223&gt; Xaa = Asn, Ser, Ala, OR NONE

&lt;220&gt;

&lt;221&gt; UNSURE

<222> (11)  
<223> Xaa = Ser, Lys, OR Pro

<220>  
<221> UNSURE  
<222> (12)  
<223> Xaa = Leu, Ser, Thr, OR Ala

<220>  
<221> UNSURE  
<222> (13)  
<223> Xaa = Leu OR Phe

<220>  
<221> UNSURE  
<222> (14)  
<223> Xaa = Pro, Thr, OR NONE

<220>  
<221> UNSURE  
<222> (15)  
<223> Xaa = Val, ley, OR Asn

<220>  
<221> UNSURE  
<222> (16)  
<223> Xaa = Pro OR Leu

<220>  
<221> UNSURE  
<222> (17)  
<223> Xaa = Ser OR Cys

<220>  
<221> UNSURE  
<222> (18)  
<223> Xaa = Pro, Thr, OR Ala

<220>  
<221> UNSURE  
<222> (19)  
<223> Xaa = Pro, Arg, OR Ser

<220>  
<221> UNSURE  
<222> (20)  
<223> Xaa = Pro, Val, Phe, OR Leu

<220>  
<221> UNSURE  
<222> (21)  
<223> Xaa = Ser ORPro

<220>  
<221> UNSURE  
<222> (22)  
<223> Xaa = Gly, Ser, Phe, OR Asn

<220>  
<221> UNSURE  
<222> (24)

<223> Xaa = Thr, Ala, OR Asn

<220>

<221> UNSURE

<222> (25)

<223> Xaa = Leu, Pro, OR Lys

<220>

<221> UNSURE

<222> (26)

<223> Xaa = Ser, Pro, Gly, OR Lys

<220>

<221> UNSURE

<222> (27)

<223> Xaa = Ser, Pro, Gln, OR Ala

<220>

<221> UNSURE

<222> (28)

<223> Xaa = Asn OR Ala

<220>

<221> UNSURE

<222> (29)

<223> Xaa = His, Gln, OR Arg

<220>

<221> UNSURE

<222> (30)

<223> Xaa = Ala, Leu, OR Val

<220>

<221> UNSURE

<222> (31)

<223> Xaa = Ser, Lys, Thr, OR Arg

<220>

<221> UNSURE

<222> (32)

<223> Xaa = Pro OR Thr

<220>

<221> UNSURE

<222> (33)

<223> Xaa = Leu, Ile, OR Ser

<220>

<221> UNSURE

<222> (34)

<223> Xaa = Ala OR His

<220>

<221> UNSURE

<222> (35)

<223> Xaa = Ala OR Ser

<220>

<221> UNSURE

<222> (36)

<223> Xaa = Pro, Ser, OR Phe

<220>  
<221> UNSURE  
<222> (37)  
<223> Xaa = Pro, Thr, OR Ala

<220>  
<221> UNSURE  
<222> (38)  
<223> Xaa = Cys, Ala, Ser, OR Pro

<220>  
<221> UNSURE  
<222> (39)  
<223> Xaa = Arg, Pro, Thr, OR His

<220>  
<221> UNSURE  
<222> (40)  
<223> Xaa = Arg, Gly, OR NONE

<220>  
<221> UNSURE  
<222> (41)  
<223> Xaa = Arg OR Leu

<220>  
<221> UNSURE  
<222> (42)  
<223> Xaa = Ser OR Arg

<220>  
<221> UNSURE  
<222> (43)  
<223> Xaa = Arg, Cys, His, OR Gly

<220>  
<221> UNSURE  
<222> (44)  
<223> Xaa = Arg OR Leu

<220>  
<221> UNSURE  
<222> (45)  
<223> Xaa = Arg OR Ala

<220>  
<221> UNSURE  
<222> (46)  
<223> Xaa = Ile, Leu, OR Val

<220>  
<221> UNSURE  
<222> (47)  
<223> Xaa = Ser, Ala, OR NONE

<220>  
<221> UNSURE  
<222> (48)  
<223> Xaa = Ala, Val, OR NONE

<220>  
<221> UNSURE  
<222> (49)  
<223> Xaa = Thr, Val, OR NONE

<220>  
<221> UNSURE  
<222> (50)  
<223> Xaa = Ala OR Ser

<220>  
<221> UNSURE  
<222> (51)  
<223> Xaa = Thr, Ala OR Asn

<220>  
<221> UNSURE  
<222> (52) (53)  
<223> Xaa = Ala OR Ser

<220>  
<221> UNSURE  
<222> (54)  
<223> Xaa = Pro, Gln, OR Ser

<220>  
<221> UNSURE  
<222> (55)  
<223> Xaa = Ser, Ala, OR Pro

<220>  
<221> UNSURE  
<222> (56)  
<223> Xaa = Pro, Ala, OR Leu

<220>  
<221> UNSURE  
<222> (57)  
<223> Xaa = Ser, Leu, OR Ala

<220>  
<221> UNSURE  
<222> (58)  
<223> Xaa = Ser, Ala, OR Pro

<220>  
<221> UNSURE  
<222> (60)  
<223> Xaa = Ala, Glu, OR Gln

<220>  
<221> UNSURE  
<222> (61)  
<223> Xaa = Ala OR Thr

<220>  
<221> UNSURE  
<222> (63)  
<223> Xaa = Thr, Ser, OR NONE

<220>

<221> UNSURE  
<222> (64)  
<223> Xaa = Glu OR Ala

<220>  
<221> UNSURE  
<222> (65)  
<223> Xaa = Ala, Ser, OR Gly

<220>  
<221> UNSURE  
<222> (66)  
<223> Xaa = Leu OR Gln

<220>  
<221> UNSURE  
<222> (67)  
<223> Xaa = Ser, Tyr, OR Asn

<220>  
<221> UNSURE  
<222> (75)  
<223> Xaa = Ala OR Ser

<220>  
<221> UNSURE  
<222> (81)  
<223> Xaa = Arg OR Lys

<220>  
<221> UNSURE  
<222> (83)  
<223> Xaa = Arg OR Lys

<220>  
<221> UNSURE  
<222> (87)  
<223> Xaa = Val OR Ile

<220>  
<221> UNSURE  
<222> (107)  
<223> Xaa = Arg OR Asn

<220>  
<221> UNSURE  
<222> (118)  
<223> Xaa = Arg OR His

<220>  
<221> UNSURE  
<222> (134)  
<223> Xaa = Leu, Gly, OR Gln

<220>  
<221> UNSURE  
<222> (136)  
<223> Xaa = Val OR Leu

<220>  
<221> UNSURE

<222> (137)  
<223> Xaa = Gly OR Asn

<220>  
<221> UNSURE  
<222> (138)  
<223> Xaa = Val OR Ile

<220>  
<221> UNSURE  
<222> (139)  
<223> Xaa = Glu OR Pro

<220>  
<221> UNSURE  
<222> (140)  
<223> Xaa = Pro OR Ala

<220>  
<221> UNSURE  
<222> (141)  
<223> Xaa = Gln OR Val

<220>  
<221> UNSURE  
<222> (144)  
<223> Xaa = Asp OR Asn

<220>  
<221> UNSURE  
<222> (152)  
<223> Xaa = Leu OR Asp

<220>  
<221> UNSURE  
<222> (153)  
<223> Xaa = Thr OR Asn

<220>  
<221> UNSURE  
<222> (156)  
<223> Xaa = Val OR Ile

<220>  
<221> UNSURE  
<222> (158)  
<223> Xaa = Glu OR Ser

<220>  
<221> UNSURE  
<222> (163)  
<223> Xaa = Gly OR Arg

<220>  
<221> UNSURE  
<222> (168)  
<223> Xaa = Asn, Glu, Thr, OR Gln

<220>  
<221> UNSURE  
<222> (170)



<223> Val OR Leu

<220>

<221> UNSURE

<222> (174)

<223> Xaa = Asn, Lys, OR Arg

<220>

<221> UNSURE

<222> (175)

<223> Xaa = Ile, Leu, Lys, OR Pro

<220>

<221> UNSURE

<222> (176)

<223> Xaa = Ala OR Pro

<220>

<221> UNSURE

<222> (178)

<223> Xaa = Thr, Ala, OR Gly

<220>

<221> UNSURE

<222> (179)

<223> Xaa = Thr OR Ser

<220>

<221> UNSURE

<222> (181)

<223> Xaa = Val OR Ile

<220>

<221> UNSURE

<222> (182)

<223> Xaa = Gly OR Ser

<220>

<221> UNSURE

<222> (184)

<223> Xaa = Ser OR Cys

<220>

<221> UNSURE

<222> (185)

<223> Xaa = Gly, Trp, OR Arg

<220>

<221> UNSURE

<222> (186)

<223> Xaa = Lys OR Met

<220>

<221> UNSURE

<222> (187)

<223> Xaa = Asp OR Glu

<220>

<221> UNSURE

<222> (188)

<223> Xaa = Gly OR Ala

<220>

<221> UNSURE

<222> (191)

<223> Xaa = Ile OR Leu

<220>

<221> UNSURE

<222> (192)

<223> Xaa = Thr OR Asn

<220>

<221> UNSURE

<222> (193)

<223> Xaa = Glu OR Ala

<220>

<221> UNSURE

<222> (196)

<223> Xaa = Ala OR Ser

<220>

<221> UNSURE

<222> (198)

<223> Xaa = Asn, Lys, OR Asp

<220>

<221> UNSURE

<222> (199)

<223> Xaa = Glu OR Ala

<220>

<221> UNSURE

<222> (200)

<223> Xaa = Lys OR Ala

<220>

<221> UNSURE

<222> (201)

<223> Xaa = Ala, Gly, OR Asp

<220>

<221> UNSURE

<222> (203)

<223> Xaa = Gly OR Arg

<220>

<221> UNSURE

<222> (204)

<223> Xaa = Phe OR Tyr

<220>

<221> UNSURE

<222> (207)

<223> Xaa = Glu OR Gly

<220>

<221> UNSURE

<222> (209)

<223> Xaa = Ser, Trp, Ala, OR Thr

<220>  
<221> UNSURE  
<222> (211)  
<223> Xaa = Val OR Lys

<220>  
<221> UNSURE  
<222> (212)  
<223> Xaa = Asp OR Asn

<220>  
<221> UNSURE  
<222> (213)  
<223> Xaa = Ala OR Pro

<220>  
<221> UNSURE  
<222> (214)  
<223> Xaa = Thr, Ala, OR Ser

<220>  
<221> UNSURE  
<222> (217)  
<223> Xaa = Arg OR His

<220>  
<221> UNSURE  
<222> (218)  
<223> Xaa = Pro OR Ser

<220>  
<221> UNSURE  
<222> (219)  
<223> Xaa = Ile OR Leu

<220>  
<221> UNSURE  
<222> (221)  
<223> Xaa = Ala OR Asp

<220>  
<221> UNSURE  
<222> (222)  
<223> Xaa = Thr, Ala, OR Ser

<220>  
<221> UNSURE  
<222> (223)  
<223> Xaa = Gly OR Ser

<220>  
<221> UNSURE  
<222> (228)  
<223> Xaa = Val OR Ile

<220>  
<221> UNSURE  
<222> (229)  
<223> Xaa = Ala OR Thr

<220>  
<221> UNSURE  
<222> (230)  
<223> Xaa = Thr OR Ser

<220>  
<221> UNSURE  
<222> (232)  
<223> Xaa = Gly OR Ala

<220>  
<221> UNSURE  
<222> (236)  
<223> Xaa = Thr OR Ser

<220>  
<221> UNSURE  
<222> (239)  
<223> Xaa = Ala OR Pro

<220>  
<221> UNSURE  
<222> (247)  
<223> Xaa = Ala OR Val

<220>  
<221> UNSURE  
<222> (251)  
<223> Xaa = Ile OR Leu

<220>  
<221> UNSURE  
<222> (254)  
<223> Xaa = Ala OR Ser

<220>  
<221> UNSURE  
<222> (255)  
<223> Xaa = Ile, Leu, OR Val

<220>  
<221> UNSURE  
<222> (261)  
<223> Xaa = Leu OR Ile

<220>  
<221> UNSURE  
<222> (263)  
<223> Xaa = Ile OR Leu

<220>  
<221> UNSURE  
<222> (267)  
<223> Xaa = Ser OR Ala

<220>  
<221> UNSURE  
<222> (271)  
<223> Xaa = Glu OR Ala

<220>

<221> UNSURE  
<222> (274)  
<223> Xaa = Asp OR Asn

<220>  
<221> UNSURE  
<222> (277)  
<223> Xaa = Gly OR Asp

<220>  
<221> UNSURE  
<222> (282)  
<223> Xaa = Val, Glu, OR Lys

<220>  
<221> UNSURE  
<222> (283)  
<223> Xaa = Val OR Ile

<220>  
<221> UNSURE  
<222> (286)  
<223> Xaa = Lys OR Ala

<220>  
<221> UNSURE  
<222> (290)  
<223> Xaa = Lys, Gln, OR Arg

<220>  
<221> UNSURE  
<222> (292)  
<223> Xaa = Val OR Met

<220>  
<221> UNSURE  
<222> (293)  
<223> Xaa = Glu OR Ala

<220>  
<221> UNSURE  
<222> (294)  
<223> Xaa = Asp OR Glu

<220>  
<221> UNSURE  
<222> (296)  
<223> Xaa = Lys OR Gln

<220>  
<221> UNSURE  
<222> (298)  
<223> Xaa = Gly OR Ala

<220>  
<221> UNSURE  
<222> (306)  
<223> Xaa = Glu, Asn OR Gly

<220>  
<221> UNSURE

<222> (310)  
<223> Xaa = Arg OR His

<220>  
<221> UNSURE  
<222> (311)  
<223> Xaa = Ala OR Ser

<220>  
<221> UNSURE  
<222> (317)  
<223> Xaa = His OR Ile

<220>  
<221> UNSURE  
<222> (340)  
<223> Xaa = Thr OR Ala

<400> 12  
Met Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
1 5 10 15  
Xaa Xaa Xaa Xaa Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
20 25 30  
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
35 40 45  
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Ala Xaa Xaa Ala Xaa Xaa  
50 55 60  
Xaa Xaa Xaa Arg Val Asp Val Leu Ser Glu Xaa Leu Pro Phe Ile Gln  
65 70 75 80  
Xaa Phe Xaa Gly Lys Thr Xaa Val Val Lys Tyr Gly Gly Ala Ala Met  
85 90 95  
Lys Ser Pro Glu Leu Gln Ala Ser Val Ile Xaa Asp Leu Val Leu Leu  
100 105 110  
Ser Cys Val Gly Leu Xaa Pro Val Leu Val His Gly Gly Gly Pro Glu  
115 120 125  
Ile Asn Ser Trp Leu Xaa Arg Xaa Xaa Xaa Xaa Xaa Xaa Phe Arg Xaa  
130 135 140  
Gly Leu Arg Val Thr Asp Ala Xaa Xaa Met Glu Xaa Val Xaa Met Val  
145 150 155 160  
Leu Val Xaa Lys Val Asn Lys Xaa Leu Xaa Ser Leu Ile Xaa Xaa Xaa  
165 170 175  
Gly Xaa Xaa Ala Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Arg Leu Xaa Xaa  
180 185 190  
Xaa Arg Pro Xaa Pro Xaa Xaa Xaa Xaa Leu Xaa Xaa Val Gly Xaa Val  
195 200 205  
Xaa Arg Xaa Xaa Xaa Xaa Val Leu Xaa Xaa Xaa Ile Xaa Xaa Xaa His  
210 215 220

Ile Pro Val Xaa Xaa Xaa Val Xaa Ala Asp Glu Xaa Gly Gln Xaa Tyr  
225 230 235 240

Asn Ile Asn Ala Asp Thr Xaa Ala Gly Glu Xaa Ala Ala Xaa Xaa Gly  
245 250 255

Ala Glu Lys Leu Xaa Leu Xaa Thr Asp Val Xaa Gly Ile Leu Xaa Asp  
260 265 270

Arg Xaa Asp Pro Xaa Ser Leu Val Lys Xaa Xaa Asp Ile Xaa Gly Val  
275 280 285

Arg Xaa Met Xaa Xaa Xaa Gly Xaa Val Xaa Gly Gly Met Ile Pro Lys  
290 295 300

Val Xaa Cys Cys Val Xaa Xaa Leu Ala Gln Gly Val Xaa Thr Ala Ser  
305 310 315 320

Ile Leu Asp Gly Arg Val Pro His Ser Leu Leu Leu Glu Ile Leu Thr  
325 330 335

Asp Glu Gly Xaa Gly Thr Met Ile Thr Gly  
340 345

A  
cont